

A
Handbook
of
Gymnastics

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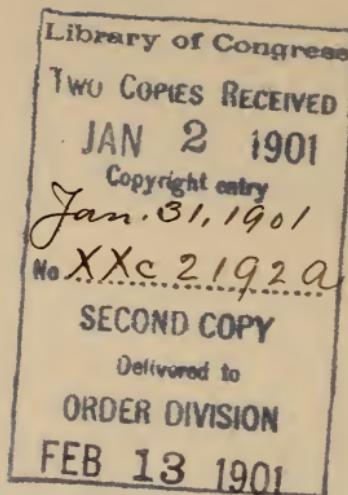
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UNITED STATES OF AMERICA.

A HANDBOOK
OF
GYMNASTICS

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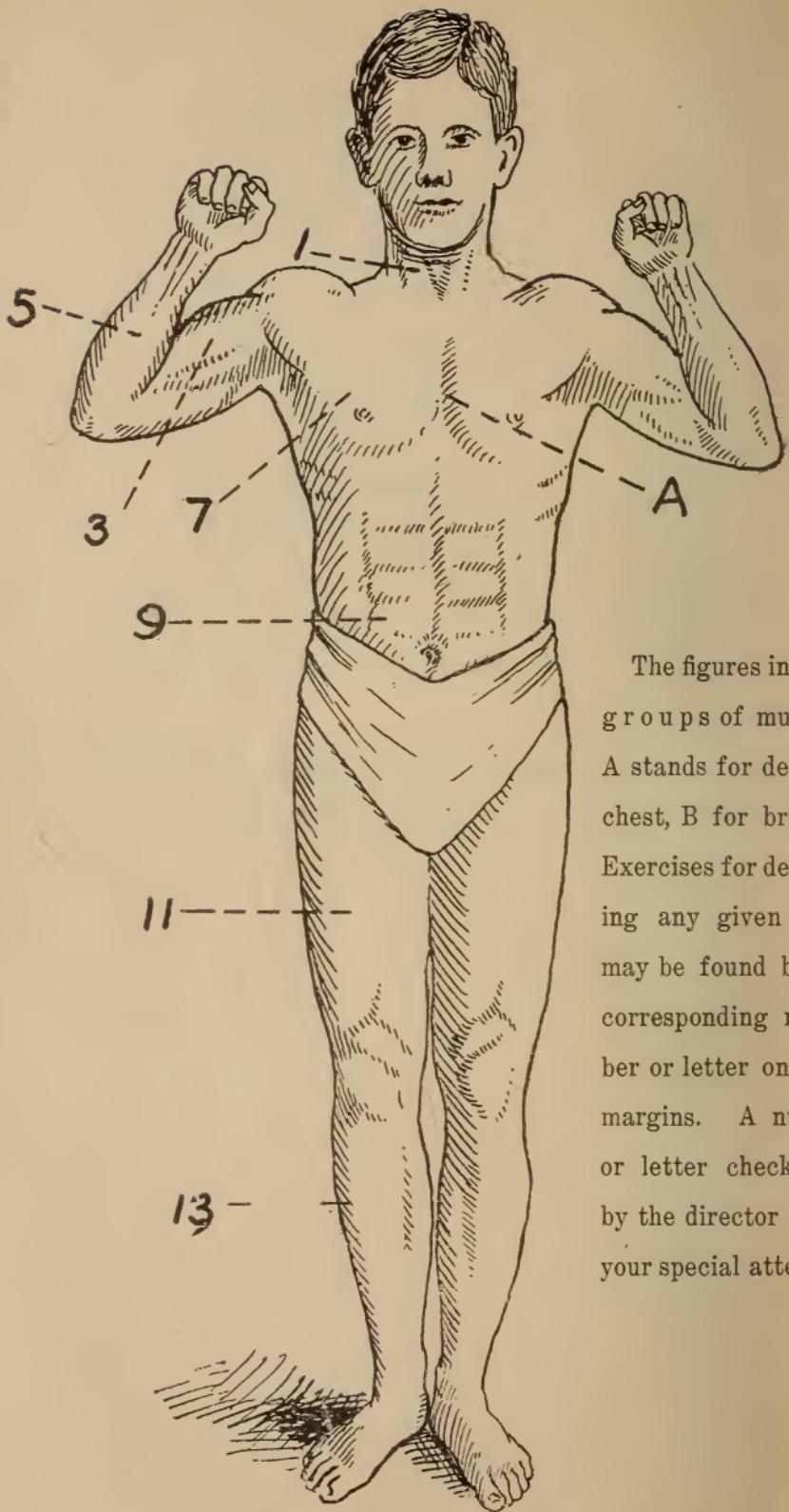


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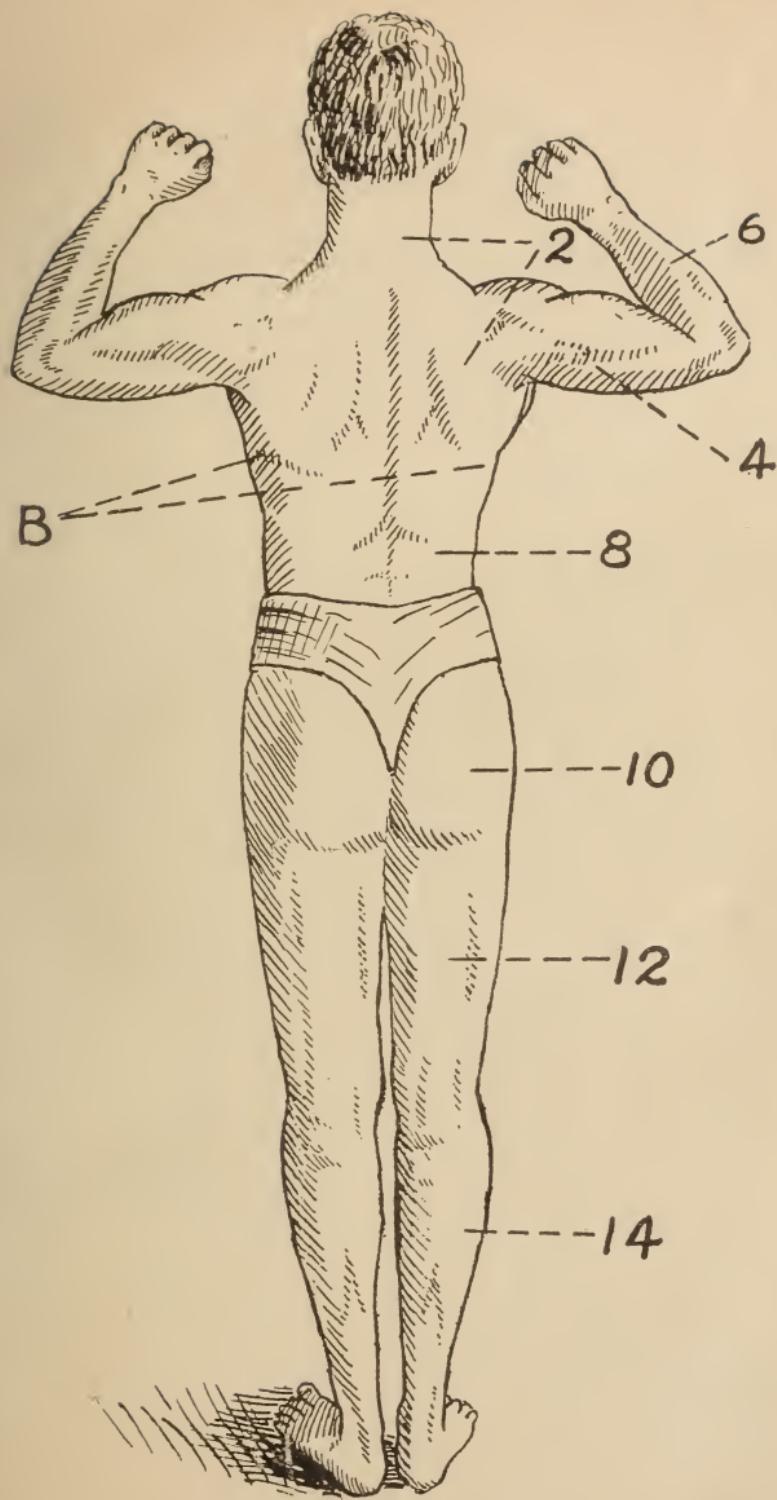
1900.

The drawings for the illustrations in this book were made by Professor J. N. Bradford, from photographs taken in the gymnasium.

The first six series in "Free Gymnastics" were arranged by Associate Professor Clara Maud Berryman.



The figures indicate groups of muscles; A stands for depth of chest, B for breadth. Exercises for developing any given part may be found by the corresponding number or letter on page margins. A number or letter checked \checkmark by the director needs your special attention



INTRODUCTION.

THE demands on the time of the bread winners to-day are more direct and exacting than ever before. In keeping pace with those who are devoting their best energies to accomplishing success in life, one important factor is likely to be neglected: the maintenance of the physical condition necessary to supply the resources.

That we may be able to meet these demands it is essential that the brain should receive its proper supply of nutriment both in quality and quantity, and we should furnish this with the least possible waste of material.

The weight of the muscles is equal to that of all of the rest of the body together. It is plain enough then that in order to have good health we must give the muscles some work to do. If we had a medium of circulation whereby food substances called for by any part could be directed to that particular spot without being sent all over the body, many ills of life would be averted. Unfortunately for the health and happiness of many people, when the brain calls for a supply of food the material courses with equal force through the entire body. It follows that the brain gets less than it needs and uses up its reserve material, and some of the other organs of the body get more than they need and suffer from being over fed which materially embarrasses their normal functions. The result of this unhealthful condition is that the blood which goes to the brain is not as full of the constituents which go to

make up nervous energy as it should be and therefore the brain can not run to its full capacity. The other organs of the body are surcharged with materials for which they have no need and in order to rid themselves of these, an unnecessary amount of labor is required. This condition can be obviated by calling upon each organ of the body to do its physiological work.

Physicians have long recognized the value of exercise in the cure and prevention of disease. Some have carefully studied its effects on convalescents and invalids so that they may know more definitely the kind and quantity suited to the individual and the frequency with which it should be taken.

It is a well known principle that for any given amount of tissue used up in exercise, new material is sent immediately to replace it. Up to a certain point (which few of us ever attain) where we reach our limit in growth and development, the new material furnished is slightly in excess of that which has been broken down in the performance of any exercise. It is in this way that by taking a reasonable amount of exercise daily, we may attain our proper growth.

In childhood and youth, development is much more rapid than it is in middle age; hence it is essential that young persons should take more exercise and should eat more than those of middle age.

Physical training consists not only in assisting physical growth but in a development of nervous force and in the training of the nerve centers which govern and control the varied movements and functions of the body. It is this education and development which go

to make up a healthy body. It should be the aim of every youth to lay up such a store of health and energy during the period of life in which nature is so willing to give, that he may have a full storehouse on which to draw in his mature years.

EXERCISE.

Exercise should be taken regularly every day, at the same time if possible. When it is not practicable to exercise in the gymnasium or out of doors one should adopt some form of indoor exercise to take its place. Exercise should always stop short of fatigue. An excellent plan is to exercise on rising in the morning. This increases the circulation of the blood through the tissues, flushes out the broken down material which has accumulated during the night and leaves new material in its stead.

For the same reason it should be taken after prolonged mental exertion. Besides flushing the brain, the blood then finds work to do throughout the muscles and this relieves the brain tension. If tired after exercise it is best to rest half an hour before going out into the cold.

BATHING.

To prescribe any set rule for bathing is somewhat difficult on account of the physical peculiarities of different individuals. It is advisable to commence the bath with warm water for cleansing purposes and end it with a dash of cold water to cool and tone the surface of the body so that the reaction from the bath gives the skin a healthy glow. As a rule one should not remain in a bath more than ten minutes. Too much warm water tends to depress one. The cold

water should be applied long enough to produce a healthy reaction, leaving a pleasant and invigorating sensation.

Warm and cold are comparative terms so that each one must govern the temperature of the bath to suit his own idea of what they mean.

SMOKING.

Perhaps the most apparent effect of the use of tobacco is its action on the heart. The excessive use of tobacco produces an excitable and irritable heart. Its use should be prohibited among those who are training for any physical exercise where great strength, speed or endurance is likely to be required.

The heart is the great pump that sends the blood throughout the body charged with oxygen and those materials which supply all parts of the body. If the heart is interfered with, the supply is necessarily lessened. The result of this interference with the heart's action and consequent supply is particularly noticeable in speed exercises such as running, bicycling and games where, as is well known, the users of tobacco become more easily exhausted than those who do not use it.

It is a question if the effect of tobacco is not more far reaching than this. It is reasonable to suppose that if it so easily affects the heart as to interfere with the natural blood supply, its continued use would impede the growth and development of the youth, consequently it should not be used during that period.

SLEEPING.

The sleeping room and bed clothing should be well aired every morning.

All sleeping rooms should receive sunlight at least a part of every day.

If troubled with sleeplessness eat a few wafers and take a glass of milk before retiring.

The bed should be placed in the room some distance from the wall so that the expired air may have a chance to mix freely with the air of the room.

VENTILATION.

All living rooms should be well ventilated.

An old fashioned stove or fireplace is a good ventilator.

Cover up well if it is cold and avoid sitting or sleeping in a direct draft.

It is more healthful to live in a cool room well ventilated, than in a warm room without ventilation. This is particularly true of sleeping apartments, which should have free communication with the outside air—one cannot get too much of it.

CLOTHING.

While exercising it is best to wear light clothing.

You will not catch cold if you keep moving while you are warm.

Do not sit down after exercising until you have taken your bath and changed your clothing.

STOOLED SHOULDERS.

The spine is composed of a column of blocks shaped and bound together in such a manner as to form curves which serve as a spring to lessen shock to the delicate brain structures and add to the grace and ease of locomotion.



Figure 1.

INCORRECT.

One of the most common deformities of the spine is stooped shoulders. In correcting round shoulders it is well to bear in mind the structure and shape of the spinal column, to remember that where it is bent one way, there must be a reciprocating curve in the opposite direction, else the body would lose its balance. In other words, if the head is bent forward the shoulders are bound to be stooped; the easiest way then to overcome this deformity is to correct the curves of the spine. Therefore, if the head is held well back with the chin down, the hump on the back will disappear, the chest stand out in front as it ought, the shoulders drop back where they belong, the curves of the spine resume their normal shape, and the body an erect position. A good way to learn the correct position is to stand against a perpendicular plane, (a door will answer the purpose) with the heels, hips, shoulders, and back of the head touching, keeping the chin close to the sternum.

It is difficult to sit straight any length of time in a chair; it requires too much muscular effort, and one is apt to assume a posture more or less bent. It is well then on rising from sitting to take the position just described.

An exercise that will do much to correct stooped shoulders is described on page 26, Figure 20.



Figure 2.

CORRECT.

FREE GYMNASTICS.

First Series.

1. Stand with heels together, hands on hips. Drop the head forward ; drop the head backward ; drop the head to right side ; drop the head to left side ; each movement slowly 4 times.



Figure 3.

1
2

2. Hands in front of chest, palms together, thrust elbows back, shoulder high, hands closed, 8 times.. Energize the backward movement ; when the elbows are shoulder high the forearm must form a right angle with upper arm. Be careful not to allow the head to come forward when the arms are thrust backward. (Fig. 3.)

2
8
A

3. Extend arms sidewise shoulder high and clap hands in front of chest, 16 times ; do not allow the head to come forward as the arms are brought backward.

4. Hands on hips. Bend forward at waist, relaxing the arms ; return to upright position with hands on hips ; 4 times.

8

5. Tip-step forward with left foot 8 times.

“ “ “ right “ “

“ “ “ alternate “

6. Tip-step sidewise with left foot 8 times.

“ “ “ right “ “

11

14

7. Tip-step backward with left foot 8 times.

“ “ “ right “ “

8. Extend the left foot touching toe, then heel to floor, 16 times. Same with right foot 16 times.

13

14

9. Bend the knees 8 times.

10. Arms at sides palms in, raise arms slowly shoulder high taking in a full, deep breath ; lower slowly, slowly exhalting ; 8 times.

B

Second Series.

1. Hands on hips. Extend the chin forward and bring it back to position with force, energize the backward movement, 8 times. The shoulders must remain in position during this movement.

2

2

2. Hands at sides, clap hands over head 8 times.

3. Finger tips on shoulder, elbows forward. Swing elbows sidewise and backward 8 times. Do not let the head come forward in this exercise.

4. Hands on hips, bend forward at waist 4 times.

Hands on hips, bend sidewise left at waist 4 times.

8

Hands on hips, bend sidewise right at waist 4 times.

Change position of hands on the hips by placing the fingers behind and the thumbs in front of hips.

B

9

Hands on hips, bend slightly backward 4 times.

5. Hands on hips. Raise the left knee forward 4 times. (Fig. 4.)



11

Raise the right knee forward 4 times.

Raise the left heel backward 4 times.

Raise the right heel backward 4 times.

6. Hands on hips. Rise on toes 8 times.

14

7. Hands on hips. Bend the left knee and tip-step sidewise with right foot 4 times; bend the right knee and tip-step sidewise with left foot 4 times.

11

8. Hands on hips. Bend the left knee and tip-step forward with right foot 4 times. Bend the right knee and tip-step forward with left foot 4 times.

14

9. Hands on hips. Raise the left arm in circle over head, looking up at hand, 8 times.

Raise the right arm in circle over head, looking up at hand, 8 times.

Raise alternate arms in circle over head, looking up at hand, 8 times.

Raise both arms in circle over head, looking up at hand, 8 times.

10. Raise hands slowly in front of chest, backs together, inhaling slowly; separate and slowly lower at sides, exhaling.

2
B

A

Third Series.

1. Lie on back on mat, arms at sides, palms in. Raise head 4 times.

“ left arm 4 times.

2

“ right “ “

“ alternate arms 4 times.

“ both “ “

2. Flex left knee 4 times.

“ right “ “

11

“ alternate knees 4 times.

“ both “ “

3. Knees flexed, flex left knee on chest 4 times.

“ right “ “ “

9

“ alternate knees 4 times

“ both “ “ “

4. Legs extended, flex left foot 4 times.

“ right “ “ “

11

“ alternate feet 4 times.

13

“ both “ “ “

5. Legs extended, extend left foot 4 times.

“ right “ “ “

14

“ alternate feet 4 times.

“ both “ “ “

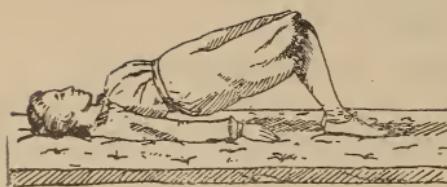


Figure 5.

6. Knees flexed,
raise body on toes and
shoulders 2 times.

9

(Fig. 5.)

7. Arms at sides,
flex and extend the
fingers of both hands
8 times.

5

8. Extend the arms sidewise shoulder high,
flex and extend the fingers of both hands 8 times.

6

9. Arms at sides; slowly raise both arms
upward, inhaling; slowly lower, exhaling.

B

10. Arms at sides; take a full breath, raise
and lower arms rapidly as long as the breath lasts.

Fourth Series.

1. Lie on mat, face downward, arms crossed
under chest, resting on elbows; raise head 6 times.

2

2. Lie on right side, right arm extended on
mat, left hand on hip; raise head 4 times, raise
left leg, toes pointed, 4 times.

3. Lie on left side, left arm extended on mat,
right hand on hip; raise head 4 times, raise right
leg, toes pointed, 4 times.

4. Lie on back, legs extended, heels together;
extend left leg sidewise 4 times.

“ right “ “ “

“ alternate legs sidewise 4 times.

“ both “ “ “ “

5. Lie on mat; take a full deep breath quickly
and exhale slowly 4 times. Take a full deep
breath slowly and exhale quickly 4 times.

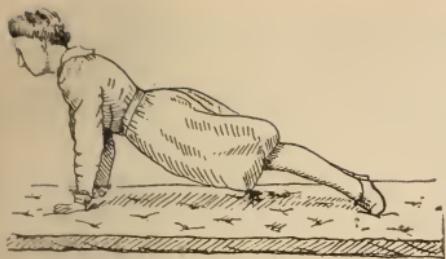


Figure 6.

on floor under chest, raise body on hands and toes 4 times. (Fig. 6.)

8. Lie on mat, face downward ; extend arms sidewise shoulder high, raise arms backward 6 times. 2

9. Lie on mat, face downward ; cross arms under chest, flex left knee 8 times ; flex right knee 8 times ; flex alternate knees 8 times ; flex both knees 8 times. 12

10. Lie on mat on back ; extend arms sidewise shoulder high, then raise arms and clap hands over the chest, 16 times. 7

Fifth Series.

1. Stand with hands on hips ; rotate head to right 4 times ; same to left 4 times. 1
2



Figure 7.

2. Step diagonally forward to the left, left arm straight over head, right arm behind back ; bend forward, touch toe of forward foot with left hand, come to upright position keeping left arm straight ; bend diagonally back until the strain is felt on the left side, 2 times. Repeat to right side. (Fig. 7.) 8
10
12
9

3. Hands on hips; bend forward and rotate trunk to the right 4 times; same to left 4 times. 8
10

4. Hands on hips; bend knees, keeping back straight and head erect, 4 times. 11

5. Hands on hips; rise on toes, at same time thrust arms straight up, 8 times. 14

6. Hands on hips; (1) extend arms forward shoulder high,
(2) swing to the sides shoulder high,
(3) swing forward again,
(4) hands on hips, 8 times.

7. Hands on hips; bend body to right side and touch the floor with right hand, 4 times; same to left side 4 times.

8. Hands on hips; rise on toes and then on heels 16 times. 13
14

9. In place; run by flexing alternate knees rapidly, 32 times. 11

10. Take a full, deep breath, hold through 16 counts and exhale, 8 times.

Sixth Series.

1. Lie on mat, face downward, arms crossed under chest, raise head and shoulders 4 times. 2
8

2. Roll over on back, sit up without using hands 9

3. Sit up with legs extended, and support trunk with the arms placed behind the body on the mat.

Flex left knee and cross over right knee 4 times. 9
" right " " left " " 11
" alternate knees and cross over 4 times.

4. With legs crossed, stand without using hands.

5. Hands at sides; clap hands (1) in front; (2) behind; (3) over head; (4) and return to position at sides: repeat 8 times.

6. Rise on toes, bend knees and lower the body so as to sit on heels. Bring the arms straight forward so as to steady the body as it is lowered, 8 times.

10
11
13
14

7. Hands on hips, (1) extend arms forward shoulder high and swing the arms to right twisting at waist, (2) swing to the left side, (3) same as 1, (4) to position hands on hips. (Fig. 8.)

8
9

8. Transfer all the weight of the body to the left leg; (1) swing right leg around in front of left and touch the floor with the toes, then (2) swing the right leg around behind the left leg and touch the floor with the toes, (3) swing the leg to the front, and (4) to position. 4 times right and 4 times left.

10

Figure 8.



Figure 9.

9. Rowing movement. Step diagonally forward with the left foot, bend the left knee and place the hands on the floor near the left foot; straighten the left knee and bend the right, at the same time bring the trunk to an upright position the hands on the chest as in rowing. Perform this exercise 4 times to the left and 4 times to the right side. (Fig. 9.)

8
10
12

10. Raise hands rapidly in front of chest, backs together, inhaling rapidly, separate and lower at sides exhaling, 4 times.

A

MAT.

First Series.

1. Hop on right toe forward; same with the left.	11
2. Hop on right toe backward ; same with left.	11
3. Jump forward on toes, feet together.	13
4. Jump backward on toes, feet together.	
5. Jump forward zigzag, on toes.	
6. Jump forward with a half turn ; reverse the turn every other time.	
7. Jump forward with a full turn ; reverse the turn every other time. It is best not to attempt a long jump, one is likely to lose his balance and take a hard fall. One should practice the full turn in place, before trying to gain distance.	12
8. Trot forward on all fours.	13
9. Walk on all fours, legs rigid. Touch the palms of hands to floor and bring the feet as close to the hands in the walk as they will come. <i>Do not bend the knees.</i>	14



Figure 10.

10. Alligator walk. In this exercise only the hands and feet touch the floor and the chest should be kept within an inch of the floor. (Fig. 10.)	7
	11
	14

MAT.

Second Series.

1. Frog leap. Jump from feet to hands across mat.
2. Broncho buck. Jump from feet to hands, then from hands to feet, in place.
3. Front head and shoulder roll. Jump from feet to hands, bend arms, duck the head and lightly strike shoulders on mat and roll over.
4. Back head and shoulder roll. Practically the reverse of 3.
5. Back roll to front leaning rest on hands and toes. Continue 4 to a horizontal position on hands and toes.
6. Back roll to head and hand stand.
7. Front roll over, cross the legs, reverse and do a back roll.
8. With back to mat, jump with a half turn, and do a front roll over.
9. Kip from the floor. Lie on back, roll up to head and shoulders and on return, shoot out and whip up to the feet. The spring is made from the shoulders; aid with hands by pushing on thighs or by pushing from floor. (Figs. 11, 12.)
10. Front roll and kip to feet. Combination of 3 and 9.

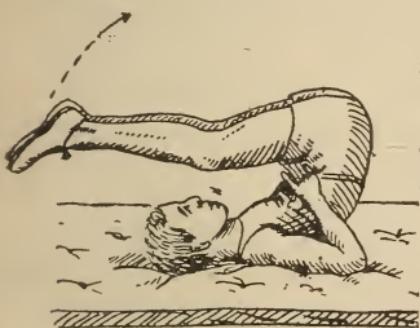


Figure 11.

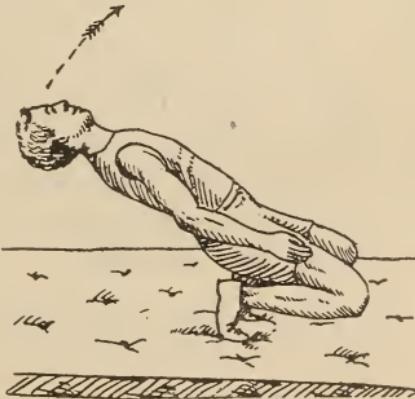


Figure 12.

11

12

13

14

MAT.

Third Series.

1. Cart wheel. In this exercise the body takes the same position it would have if spread out on a cart wheel. Revolving by striking each hand and foot to floor in rotation. 2

2. Front dive for distance with a run. Leave the floor with both feet at once, land on hands, bend the arms, duck the head and strike shoulders lightly just before the double up and roll over. 4

3. Front dive for height. 7

4. Front hand-spring. It is important that one should start right in learning the front hand-spring, else it is a difficult trick. Take a short run, then raise the hands back over the head and swing them down briskly, striking the mat near the feet, with the arms rigid. Just as the hands strike the mat the feet leave the floor with a running step, that is, one foot ahead of the other. The body turns quickly and the trick is finished by a little push from the shoulders, landing the performer on his toes, knees slightly bent, head back, chest out and back straight. The hands should be about the width of the shoulders apart as they strike the mat. 9

5. Lion's leap and front hand-spring. Jump from both feet in doing the hand-spring. 12

6. Hand-spring, one arm. 13

7. Three hand-springs in succession.

8. Front somersault.

9. Front somersault and roll over. 14

10. Front hand-spring and somersault.

MAT.

Fourth Series.

COMBINATION WORK AND TUMBLING.



Figure 13.

1. Elephant walk. The larger person faces the mat the other facing him jumps and clasps legs around his waist locking the feet, then dropping back between the legs, rests a straight arm on each ankle. The one resting on the ankles can aid the walk by lessening his weight on each foot alternately with the steps. (Figs. 13, 14.)

2. Monkey roll with two. One lies flat on his back with head at end of the mat and raises his feet toward the other who stands with one foot on each side of the prone man's neck; both now grab ankles and the upper man executes a simple front arm and shoulder roll, the under one follows.

3. Reverse 2. In doing the monkey roll backward the one standing lifts the other from the floor by his ankles just before he swings himself back to the floor, and the under man assists by pushing his own weight up with his arms.

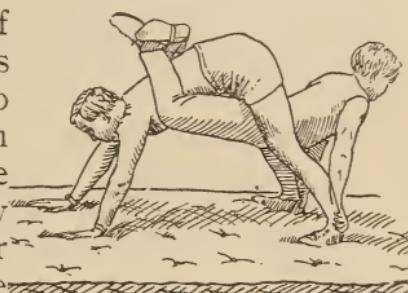


Figure 14.

2

4

5

7

8

9

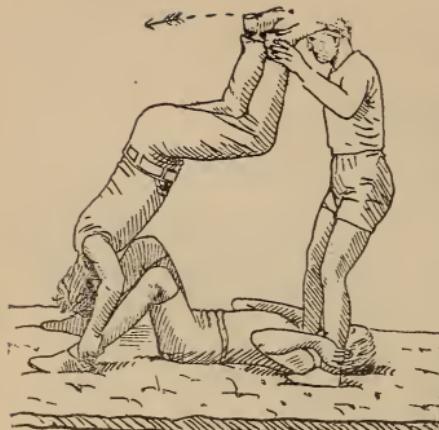


Figure 15.

4. Monkey roll with three. The same as 2 except that the third man is suspended in the air holding on to the ankles of the under man, his own ankles being held by the one in the perpendicular position. The one who is suspended must keep his back and knees bent so as to shorten the distance between the first and third man. Each should bend the knees and separate the legs when the feet strike the floor. (Fig. 15.)

5. Reverse 4.

6. Back somersault. Stoop forward bending knees, then swing arms and head back with a hard snap just as the jump is made from the floor. Double up and clap hands against backs of thighs with enough force to swing feet under. This and the following three tricks should not be attempted without the assistance of an experienced instructor.

7. Back hand-spring.

8. Flip flap ending with a back somersault.

9. Cartwheel ending with round off and back somersault.

10. Playful lambs. Three perform this exercise. Each does a dive and front roll with legs wide apart. To start, two stand one behind the other facing the third. No. 1 starts the dive and roll. No. 3 dives over him and No. 2 dives over No. 3; after the dive and roll each turns around ready for the next dive.

10

11

12

13

14

A TEN MINUTES' HOME EXERCISE.

[One should exercise a little every day. It is practically impossible for many people to attend a gymnasium so often and this little series of home exercises is given for the benefit of those who have not the opportunity of regular gymnastic work.]

1. On arising in the morning take an erect position, head back, chin down, chest out, arms hanging at the sides, hands closed; bend the wrist on the forearm and the forearm on the upper arm with all the force you can; on the swing down, bend the fist back as far as you can. Make the movements 4 times a second for 30 seconds.

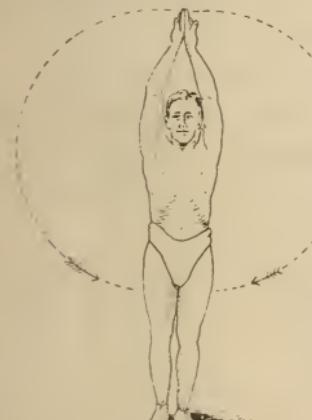


Figure 16.

2. Arms at sides, swing out at side, raising hands and strike the backs together above head. Keep the arms rigid, do the movement 30 times in 30 seconds. Persons with scrawny necks and narrow waists should double the number of movements.

(Fig. 16.)

3. With arms rigid above head, lean back as far as possible; then bend forward and down and touch the floor without bending the knees. Make the complete movement, slowly 10 times in 30 seconds. At first it is difficult for some to touch the floor with the fingers but with a little practice any one can do it. (Fig. 17.)



Figure 17.

3
5
4
6

2
B

8
9
10
12
A



Figure 18.

4. Raise the knees alternately with a hard swing as high as they will go, each 15 times in 30 seconds. (Fig. 18.)

9
11

5. Drop to a horizontal position the body resting on hands and toes, head back, chest out and body rigid; bend the arms, touch the chest to the floor and push up until arms are straight,

10 times in 30 seconds. (Fig. 19.)

4



Figure 19.

6. Clasp the hands over the head, elbows out at sides, swing from side to side 10 times in 50 seconds.

2
7
B

7. Clasp the hands back of head, point elbows to front, let head drop forward; then pull it back as far as it will go, chin down, resisting with the arms the pull-back of the head each time, 20 times in 60 seconds. This is one of the best exercises for correcting stooped shoulders. (Fig. 20.)

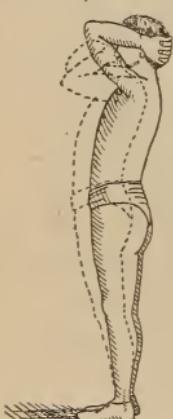
2
A

Figure 20.

8. Place the hands on hips; sit down bending hips, knees and ankles, coming up on toes; push up to the erect position 15 times in 30 seconds. (Fig. 21.)

11
13
14

Figure 21.

9. Now jump in the bath tub or take a sponge bath with tepid water and finish with a dash of cold water all over the body, dry thoroughly with a towel after which take the following exercise :

10. With both hands go all over the body rubbing the muscles hard and deep so as to assist in driving the broken down material into the circulation that it may be carried off.

DEVELOPING EXERCISES.

CHEST WEIGHTS.

FACE TOWARD WEIGHTS.

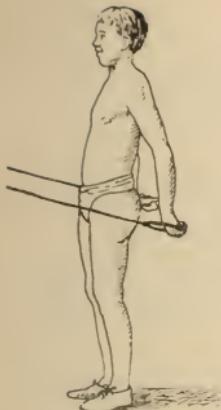


Figure 22

5. Left side to weights, left arm extended, right arm across body, palms down; pull down and to the right, left arm behind, 16 times.

6. Reverse, pull down and to the left, 16 times.

7. Face weights, alternate hands up and down, as far back as they will go, 16 times. (Fig. 23.)

8. Elbows out at side, shoulder high, thumb part of hands up; pull both hands to centre of chest, bend wrists and turn knuckles against the chest, 32 times.

9. Pull both hands back over head, arms rigid, then touch floor, *without bending knees*, 16 times.

10. Palms together; pull from side to side, $\frac{1}{2}$ circle, shoulder high, 16 times.

11. Feet 24 inches apart; pull and swing body as far as possible over each knee alternately, describing a larger half circle than in No. 10, 16 times.

12. Pull right hand to opposite side of chest, drop and extend it, at the same time pull left hand to right side, 32 times.

8

A

2

3

B

B

2

8

3

5

7

2

8

10

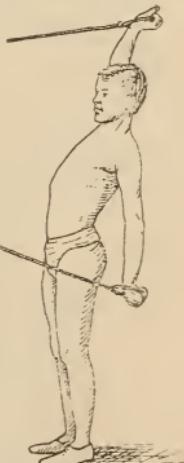


Figure 23.

11

12

3

5

7

CHEST WEIGHTS.

BACK TO WEIGHTS.

1. Change grip, back to weights, arms extended back of body, palms down ; pull down and forward, 16 times. 7

2. Hands above head, palms front, arms rigid ; pull down shoulder high in front, 16 times. A

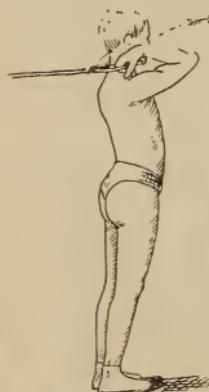


Figure 24.

3. Arms extended at side, palms front ; pull together, in front, 16 times. 7

4. Elbows in front, hands with palms down over the shoulders ; extend arms, moving elbows as little as possible, 32 times. (Fig. 24.) 4

5. Left side to weights, left arm extended, right hand back, palm up ; pull down and out, 16 times. (Fig. 25.) 6

6. Reverse and pull down and out, 16 times. 8



Figure 26.

7. Back to weights, one hand up and the other down, palms front ; alternate up and down, 16 times. (Fig. 26.) 9

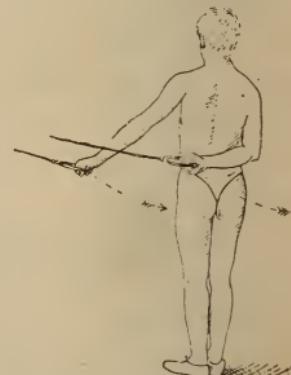


Figure 25.

8. Elbows back of body, hands over the hips ; push straight ahead, 32 times. 4

9. Left side to weights, right arm above head, palm out, left arm extended toward weights, shoulder high, palm down; pull right arm down shoulder high, and pull left arm across the body in front, 16 times.

B
8
9

10. Reverse and pull left arm down shoulder high, and right arm across the body in front, 16 times.



Figure 27.

11. Back to weights, arms extended in front, palms down, ropes below hands; let hands swing back and rise on tip-toes, 16 times.

7
9

12. Elbows at side, fore-arms extended to front, right foot in advance; push alternately right and left hand to front, 32 times. On 16th count put left foot in front. (Fig. 27.)

7
4

INTERCOSTAL MACHINE.

1. Face machine, pull straight down, bending arms.

2. Pull down front, arms and knees rigid and touch hands to floor.

3. Pull down at side, arms rigid. (Fig. 28.)

4. Separate the feet and touch both hands to floor on right and left sides alternately.

Repeat exercises with back to machine.

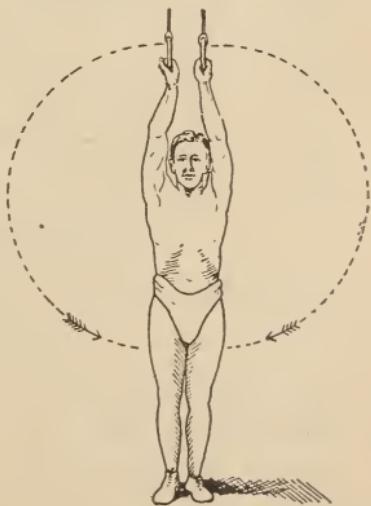


Figure 28.

WRIST MACHINE.

1. Grasp handle with both hands on top, roll away from body.	5
2. Roll toward body.	4
3. Grasp with right hand on top and bend wrist forward and backward. Same with left.	4
4. Grasp with right hand under and bend each way. Same with left.	5

ABDOMINAL MAT.

LIE ON BACK WITH FEET EXTENDED.

1. Pull body up rigid with hands at sides.	
2. Pull up with hands clasped over head.	9
3. Pull up with arms extended over head. (Fig. 29.)	
4. Raise right and left legs alternately.	9
5. Raise both legs over head.	11
6. Continue last movement over head and touch toes to floor.	



Figure 29.

UPRIGHT BARS.

1. Grasp bars, stand with toes on edge of cleat, rise on toes.	14
2. Same position, bend knees and straighten up.	11
3. Combine 1 and 2.	
4. Stand 18 inches from bars and fall forward between bars to bent arm position and return.	4
	B

5. Combine 2 and 4.

6. Grasp bars above head, swing forward and backward through bars. (Fig. 30.) **A**

7. Grasp a bar with each hand and climb. **4**

8. Same as 7 with head down. **6**

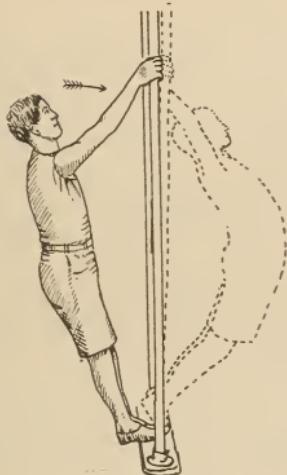


Figure 30.

9. Same exercise with one foot outside of each bar.

10. Monkey climb. Same as 9 except rest soles of feet on each bar.

ROWING MACHINE.

1. Bend knees, then pull back with arms straight at sides, straightening the legs.

2. Palms up, pull back over head, straightening the body.

3. Pull both arms to each side alternately. **3**

4. Rowing motion. Grasp both sets of handles, pull up and back, and swing down and forward on the recovery. **8**

CALISTHENICS.

MEDICINE BALL.

1. Throw from right side with both hands ; repeat from left.



Figure 31.

2. Foot ball throw. Straight throw with right arm (shoulder high) repeat with left. (Fig. 31.)

7
3

3. Shot put. Put from right shoulder ; repeat with left.

7
4

4. Throw from over head with both hands. (Fig. 32.)

9

5. Pitch from between legs.

10

6. Throw back over head.

8

7. Throw back between legs.

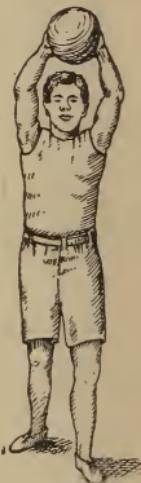


Figure 32.

8. Push from sternum.

4

9. For two persons. Straight arm throw from right and left side alternately. Same as number 2. Keep two balls going.

10. For three persons in a triangle about twelve feet apart, keep three balls going.

WANDS.

First Series.

The movements are made from position. Grasp wands, hands down, palms back.



Figure 33.

1. Flex the forearms on the arms and touch wand to chest 8 times.

2. Raise the elbows shoulder high at side, bend wrists and touch the wand to chest 8 times. (Fig. 33.)

3. Raise the wand above the back of head, arms rigid, 8 times.

4. Bring the right hand to left shoulder 8 times; left hand to right shoulder 8 times.

5. Right hand to left shoulder; touch wand to chest as in 2; left hand to right shoulder and back to position. Make movement 4 times. (16 counts.)

6. Bring wand to chest; extend arms to front; wand to chest; extend above head; drop back of head on neck; extend over head; drop to chest; then to position. Make this movement 4 times. (32 counts.)

7. Right hand to left shoulder; extend left arm at side; extend left arm above head; both arms up; left hand to right shoulder; extend right arm to right; drop right arm at side; drop left arm at side. (32 counts.)

8. Charge right foot diagonally forward and raise wand above head as in 3, 4 times. Same movement to the left 4 times. 11



Figure 34.

9. Right face; touch wand to chest; thrust to the right; return to chest, and drop to position. Repeat 4 times making a complete circle. Same exercise to left.

10. Charge to the right, placing the wand back of head on the shoulders 4 times. Same exercise to the left. (Fig. 34.)

2
11

WANDS.

Second Series.

In this series the counts 1 and 3 are similar and 4 is always position.

1. Extend right arm and foot at side, rest the left hand, palm front on right side of chest and touch toe to floor; bring feet together and extend arms above head; extend left arm and left foot at side, and return to position.

2. Extend right hand and charge right foot diagonally front; bring feet together and extend both arms front, shoulder high; extend left hand and charge diagonally to left, and return to position.

3. Charge directly to the right with both arms extended front, shoulder high; bring feet together and place wand on back of neck; charge to left and return to position. (Fig. 35.)

2

11



Figure 35.

4. Extend right arm and right foot to the right, touch the toe to the floor and rest the left hand on right side of the chest with palm front; swing right hand over to the left side reaching across as far as possible at the same time swinging the right foot to the left, touching the toe to the floor on left side; extend right arm and right foot to the right, and return to position. (Fig. 36.)

8



Figure 36.

5. Charge diagonally forward with right foot, extend right arm in same direction and place left hand back of head; charge backward with right foot leaving the right arm extended to the front, swinging the left hand to the front and across the chest to the right side; repeat the charge forward, and return to position.

11

14

6. Charge diagonally forward with right foot, extend right arm over the foot with back of the left hand resting on chest; swing to the right point wand and look directly backward; swing back to first position and recover.

8

11

7. Left oblique face and raise wand above head, arm straight; charge diagonally forward with right foot, placing the left hand on hip, with the wand in right hand strike in a high salute; return to front face, wand above head, and return to position.

2

11

8. Same as 7 except before striking, twirl the wand, and on the return, twirl it back and catch high above the head before returning to position. (Fig. 37.)

4



Figure 37.

9. Charge directly forward with right foot, extend the right arm forward and down; thrust up and back straightening the right knee and bending the left; return to first charge; return to position.

5

10. Grasp the wand with palms front, raise the right hand to the middle of chest, touch back of hand to chest, continue the twist and thrust right hand diagonally forward, and charge in same direction with right foot, place left hand back of head, recover; on the return make the same twist with left hand and thrusting left arm down at side charge directly backward; repeat the first movement and return to position. Repeat exercise, starting on left side. (Fig. 38.)

7



Figure 38.

DUMB-BELLS.

First Series.

1. Stand erect, heels together with dumb-bells resting on chest. Swing right arm to the right in a heart-shaped circle, 8 times. Same movement with left arm to left. 7

2. Swing right arm to left, heart-shaped circle, 8 times. Same movement with the left arm to right 8 times. 1

3. Swing both bells to right, heart-shaped circle, 8 times. Same movement to left. 8

4. Drop right bell at side and return to chest 8 times. Same movement with left. 3

5. Drop both bells at side and return to chest 8 times.

6. With lungs full, arms bent, swing both bells backward in a circular motion so that the bells come under the shoulders, 8 times. Exhale on 8th count and place bells on hips. A

7. Step with right foot straight forward; step diagonally forward; step sidewise; step backward, return to position after each step. Each 2 times. 11

8. Same movements with left foot 2 times.

9. Raise on the toes 16 times. 14

10. With bells at sides, twirl 6 times, on 7th count touch them to chest and on 8th count, extend at sides, twirl 6 times, touch chest and extend arms directly over head and twirl 6 times, touch chest, and extend straight to front, shoulder high, twirl 7 times, and drop at side on 8th count. 5
6

DUMB BELLS.

Second Series.

1. Bells at side, palms front, flex forearms on arms 8 times, on last count bring bells to chest ; thrust out at sides, shoulder high 8 times ; thrust above head 8 times ; thrust straight to the front 8 times and drop arms at the side.

2. With knees rigid, bend forward and place right bell on floor, return to position and throw chest out, pick bell up and repeat ; same movement to the left twice ; same movement with both bells and recover 4 times.

3. Bend hands back on the forearm then front on the forearm 8 times ; same exercise arms extended to the front ; same exercise arms extended above the head ; clasp hands in last position and—

4. bend slowly to the right and recover 4 times. Same movement to the left. (Fig. 39.)

5. Extend right foot and strike bells between legs, strike above head, strike back of hips and above head in all 4 counts twice through. Same movement with the left foot forward and place bells on hips.

6. Raise right and left knees alternately as high as they will go 16 times.

7. Separate the feet 24 inches and swing bells between the legs, then back over right shoulder 8 times ; over left shoulder 8 times and bring feet together.



Figure 39.

3
4

8
10
12

5
6

8
B

2

9
11

2
8
10

8. Bend the hips, knees and ankles and touch bells to floor; straighten up and thrust bells above the head; 8 times.

11

2

9. Bend hips, knees and ankles, and rest bells on floor; thrust right foot back and touch toe to floor and recover, twice. Same movement with left. (Fig. 40.)

10

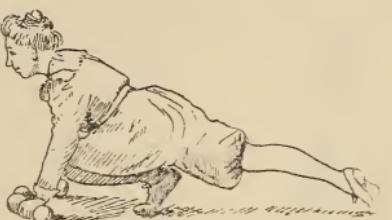


Figure 40.

10. Same position as in 9, thrust both feet back, touch toes to floor and recover, 4 times.

12

INDIAN CLUBS.

First Series.

1. Swing big circle with right club to right 8 times; same with left club to left 8 times.

1

2. Swing both clubs parallel to the right in big circles 8 times; same circles to left 8 times. (Fig. 41.)

2

3. Swing right club to right and left club to left in big circles 8 times.

3

4. Swing right club to left and left club to right in big circles 8 times.

4

5. Swing heart-shaped circle with right club to the right 8 times; same with left club to left 8 times.

5

6. Swing heart-shaped circle with right club to left 8 times; same movement with left club to right 8 times.

6



Figure 41.

7. Drop right club to right in a small circle
back of shoulder 8 times; drop left club to left,
small circle 8 times.

7



Figure 42.

8. Drop right club back of head to left in a small circle 8 times; drop left club to right 8 times; extend the wrists over the head in this movement.

8

9. Combine 5 and 7, 8 times. (Fig. 42.)

10. Combine 6 and 8, 8 times.

INDIAN CLUBS.

Second Series.

1. Windmill to right. Swing heart-shaped circles combined with shoulder circles in a windmill movement to the right 8 times, lead with left hand.

1

2. Parallel circles to the right. Swing same circles with clubs parallel 8 times. On last count swing clubs straight to the front.

2

3. Parallel circles to the left. Swing same circles, clubs parallel to the left 8 times.

3

4. Windmill to left. Swing windmill to the left, lead with right hand 8 times.

5. Four circle wind mill. Add front and back over-head circles making 4 in all, windmill, 4 times around. 16 counts.

6. Four circle parallel. Swing same circles with clubs parallel 16 counts. 4

7. Reel. Reverse right club at the end of last shoulder circle and continue clubs in out-shoulder and heart-shaped circles alternately 16 counts.

8. Alternating high circles. Swing the right club high over head in an out-wrist circle combined with a big circle, then the left, in alternating circles 16 counts. Make an extra wrist circle with right club in the same time with first circle of left club in next movement. 5

9. Front hip circles. Swing a front-hip circle combined with a large circle with left and right club alternately 16 counts. On last count continue right club to left side without making a front hip circle. 6

10. Reel with reverse side-waist circles 16 counts. In making the side circles let the right club fall toward, and the left club from the body on the left side, on the right side the left club falls toward the body, etc. 7

8

INDIAN CLUBS.

Third Series.

1. Half-snake. Swing right club in large circle to right until at arms length above right shoulder, then make a half-snake and continue into the large circle; in the meantime the left club is swung in the same circle, each club making a large and small circle alternately; 16 counts. The half-snake is made by reversing the grip on club just as it comes above the head, dropping it back on the forearm and bending the elbow; then, holding 1

knob with the fingers, swing the club up and out from front of forearm into a large circle. (Fig. 43.)

2

2. Half-snake and front-hip circles 16 counts. In this movement the right hand makes the half-snake, and the left hand the front-hip circle on the first count.

3



Figure 43.

3. Horizontal wrist circles 16 counts. Begin with right hand at left shoulder, pointing club to left ; let the free end of club swing around toward right shoulder, then straighten the arm, letting the club make a half-front circle pointing to the right, then swing across to the left shoulder, etc. While one club is making a wrist circle the other swings across.

4

4. Back-hip circles. Swing the clubs from right to left in parallel back-hip circles 8 times.

5. Five circle parallel. Continue clubs up at the right side from the last movement and swing side-waist circles, dropping clubs toward the body ; back-shoulder circles ; side-waist circles, dropping clubs away from the body on left side ; and back-hip circles, 32 counts. In the last half of this exercise separate the clubs for the hip circles and let one make a back while the other makes a front circle.

5

6. Seven-circle parallel. Swing both clubs parallel in an out-circle over left shoulder ; pass right club ahead of left and swing both parallel under the left arm ; swing back and front-hip circles ; continue into side-circle under the right arm (clubs dropping toward the body), then over the right shoulder, the left club passing the right, and back of head 16 counts.

7. Alternating heart-shaped and shoulder circles to the left 16 counts. Swing the right club in the first heart-shaped circle to the left and the left club in a shoulder-circle to the left.

8. Heart-shaped, shoulder and back-hip circles, 16 counts. Add the back-hip circles to the above movements ; on the 16th count swing both clubs toward each other back of head.

9. Back head circles 8 times. Continue the last movement, swing the clubs back of head, passing them one over the other. In this movement, as in all others where the clubs swing back of the head, extend the arms so that the wrists are back of the head, otherwise there is danger of the club hitting the head.

10. Alternating front and side circles, 16 counts. Swing right club forward, then back on left side of the body as far as it will go ; as the club comes up on the left side swing the left club forward and down to the right side of the body crossing the arms ; continue right club up and forward, then down and back on the right side, then up and forward to the left side, etc.

HEAVY GYMNASTICS.

THE BUCK.

First Series.

EXERCISES WITH OR WITHOUT A RUN.

1. Jump and kneel on right knee, free leg extended sidewise; with aid of hands straddle off.	4
2. Jump and kneel with free leg extended backward; jump off without help of hands. (Fig. 46.)	12

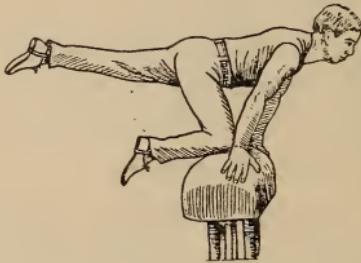


Figure 46.

3. Jump landing on one foot and knee; straddle off front.	
4. Jump and kneel on buck; without help of hands jump off.	
5. Jump and kneel on buck, jump to erect position with feet on buck, then off.	
6. Jump and squat on both feet outside of hands.	9
7. Jump and squat with feet inside of hands.	
8. Jump and squat on buck, take hands off on jump up, jump off.	
9. Same as 8 except jump off with $\frac{1}{2}$ turn to right. Same to left.	
10. Same as 8, jump off with a full turn. See remarks after 10, Second Series.	8

THE BUCK.

Second Series.

EXERCISES WITH A RUN.

1. Straddle buck. Jump from both feet, strike hands together on buck, clear buck with a split, land with feet together.

2. Straddle buck with $\frac{1}{4}$ turn. Make $\frac{1}{4}$ turn to right, place right hand on buck before landing. Turn to left.

3. Straddle buck with $\frac{1}{2}$ turn. Make a half turn to right, place both hands on buck before landing. Same to left. 2

4. Straddle buck with $\frac{1}{2}$ turn and land with hands on buck in a leaning rest. Same as 3 except come to a straight arm leaning rest facing the start. Same to left. 4

5. One hand straddle. Same as 1 except use the right hand. Same with left.

6. Straddle buck for distance, use both hands. 8

7. Squat jump on buck. Remove both hands on the rise and land with feet on buck. Jump off. 9

8. Squat jump. Same as 7 except clear 11 the buck.

9. Squat jump with $\frac{1}{2}$ turn. Clear the buck with half turn to right. Same to left. In the last two exercises neither hand is used to assist in the turn, both are taken off on the jump up. 13

10. Squat jump with a full turn. Clear the buck with a full turn. This should be done with caution, for one may take a hard fall if he doesn't land pretty squarely on his feet. 14

THE BUCK.

Third Series.

EXERCISES WITH OR WITHOUT A RUN.



Figure 44.

1. Jump to straddle on buck with quarter turn to right, straddle off. Same exercise to left. (Fig. 44.)

4

2. Jump to side leaning rest, hands on end of buck, straddle off. Same exercise to left. (Fig. 45.)

7

3. Jump with a quarter turn to side seat on right side of buck, straddle off. Same exercise to left.

8

4. Jump with a full sweep of right leg to side seat on left, straddle off front. Same exercise to left.

10

5. Jump from left with legs together to side seat on right, straddle off. Same exercise to left.



Figure 45.

6. Same as 4 except make full sweep with right leg to starting point, straddle off. Same exercise to left.

11

7. Same as 6, both legs to the right, straddle off. Same exercise to left.

12

8. Swing both legs to right and come to straddle rest on buck, and make back scissors off.

13

9. Jump with a half twist to straddle rest on buck, rest hands, swing legs, shoot off backward.

14

10. Same as 9 except clear the buck.

GERMAN HORSE.

First Series.

WITH A RUN.

(When possible keep the knees rigid, feet together and toes pointed.)

1.	Plain vault, feet to right, face front. Repeat to left.	4
2.	Plain vault and clear the horse with legs by 18 inches.	8
3.	Vault $\frac{1}{4}$ turn to right. Cut right hand from pommel and catch it before landing, face right.	
4.	Vault with full turn. Grasp right pommel with thumb out; vault to right, let go left pommel, hold right hand and make full turn with body, face front.	
5.	Vault through between pommels, let go just as the feet pass over the horse.	9
6.	Straddle vault. Jump with feet outside of pommels clearing the horse. (A beginner should jump with both feet on the horse outside of pommels before attempting to clear the horse.)	10
7.	Vault with feet to right for distance. Same to left.	
8.	Straight body vault to right. Vault, throw chest out, head back and straighten hips and knees when passing over the horse, let go right hand first. Same on the left side.	11
9.	Jump from one foot into saddle, put the other through saddle, land on hands in the saddle, one leg over; cut and catch, jump off.	13
10.	Jump from one foot through saddle, shoot both legs through, land on hands in saddle, jump off.	14

GERMAN HORSE.

Second Series.

WITHOUT A RUN.

Position. Grasp the handles, jump up at side of horse resting the weight on both hands. Throw the head back, chest out, and let the legs rest against the horse with feet together, point toes down.

1. Twist to the right and sit in the saddle, return to position ; make same turn to the left and return. 4 8

2. Twist outside of saddle to right and return ; to the left and return.

3. Cut and catch. Swing right leg to right over horse, cut and catch right hand and return. Same exercise with left leg. 11 12

4. Swing right leg to right, cut and catch, return over left side, cut and catch left hand into position. Same exercise with left leg.

5. Cut and catch without a stop between cuts. Repeat with left.

6. Cut both legs. Swing both legs to the right, cut right hand ; catch and hold a moment ; jump off. Swing to the left, same exercise.

7. Feint right leg and cut left. Swing right foot around over right end and point toe to opposite end of horse, raise the body, so that the right thigh rests on arm above the elbow, swing back to position. Then swing left leg to left, cut and catch ; cut right leg to the right and off. Same exercise from the other side. 4

8. Feint and cut right leg over left end. Swing right leg forward, as in 7; on return, swing it under left leg and over left end of horse, cut and catch left hand, then cut left leg to left; jump off. Same exercise from other side. 8

9. Feint right leg and cut both off left end. Swing right leg forward as in 7; on return, swing both legs to left, cut and catch left hand and jump off. Swing left same way. 10

10. Screw mount backward and scissors. Swing left leg back over right end of horse, catch both hands back on right handle; make scissors by swinging right leg (over) to left and left leg (under) to right and over end of horse; catch right handle with left hand, palm front, grasp left handle with right hand and swing left leg back, around and over left end of horse; hands back, grasp left handles and make scissors, grasp right and left handles and vault over right end of horse. Same exercise to the left. 11

12

GERMAN HORSE.

Third Series.

WITHOUT A RUN.

1. Rear vault through saddle. Grasp left pommel with right hand and vault through saddle backward. Same with left hand. 3

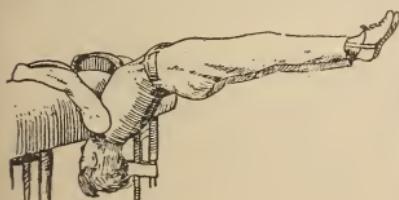


Figure 47.

2. Front lever. Lie face down on the saddle, grasp ends of pommels farthest from head. Slide and turn over, and hold body in a front horizontal position. (Fig. 47.) 4

3. Vault to a back rest and return. Vault to right, cut and catch right hand in a back arm rest, swing across left end, cut and catch left hand into position. Repeat to left.

5

4. Scissors from saddle. Swing right leg to right, cut and catch right hand, then swing right leg back and left leg forward over left end, cut and catch left hand; swing right leg over, cut and catch; jump off.

5. Continuous scissors in saddle. Start with right leg and swing same exercise from side to side, cut and catch each hand alternately.

7

6. Jump with feet outside of handles, cut and catch both hands, hold feet out, point toes; jump off.

7. Hand-spring over the horse, standing, and with a run. Rest the weight on bent arms, duck head over horse, double up just after the spring and do not straighten out until body is falling on other side. The fault with a great many in this exercise is that they straighten out too soon.

12

8. Pirouette over end of horse. Jump to the right, hold and pirouette on left arm swinging around and out over the left end of horse. Same exercise to the left.

8

9. Pirouette to starting place. Jump to the right, pirouette on left arm swinging clear around over left end of horse to starting place. Same exercise to the left.

9

10. Pirouette to end straddle. Jump and swing as above, land astride left end of horse, back to saddle and right hand in front for support; with both hands in front, vault out. Same exercise to the left.

11

*LONG HORSE.

First Series.

WITH A RUN.

The pommels are taken off and the horse placed lengthwise.

1. Jump to front straddle, legs straight, swing 11 off.
2. Jump to squatting position on horse, drop 12 to straddle and swing off.
3. Jump to squatting position, drop to front leaning rest on toes and hands, then straddle and swing off at side.
4. Vault over end of horse with right leg to left side. Same with left leg to right side.
5. Jump with twist to back straddle, legs straight, swing off at side.
6. Jump to front straddle, then with hands back make front scissors and swing off.
7. Jump with twist to back straddle, then with hands in front make back scissors, swing off. 8
8. Jump on horse with arms straight, legs straight, resting on hands and toes ; drop to straddle and swing off. 9
9. With big run jump to straddle on neck of 11 horse, swing off.
10. Run, jump to straddle on neck of horse ; 12 make back scissors and clear end of horse.

*Arranged by Mr. Huddleson.

*LONG HORSE.

Second Series.

WITH A RUN.

The pommels are taken off and the horse placed lengthwise.

1. Vault horse, running on hands.	4
2. Vault horse, striking hands at farther end.	
3. Same as 2 with feet together over end.	
4. Jump with back scissors to straddle on horse.	11
5. Jump with front scissors to straddle on horse.	
6. Front roll over on horse to straddle. The roll should be practiced with an assistant at side to keep the performer from falling on the floor.	9
7. Front roll over on horse, feet together, legs straight on horse ; roll back to straddle.	8
8. Roll over end of horse to floor.	
9. Front scissors, clear near end of horse.	
10. Back scissors, clear far end of horse.	10

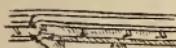
*Arranged by Mr. Huddleson

HORIZONTAL LADDER.

First Series.

WITHOUT A SWING.

1. Travel forward by stepping from one round to the other. 2



2. Same movement backward.

3. Side hang, travel sidewise by advancing with one hand and following with the other. (Fig. 48.)



4. The same except take several short steps with advanced hand, then follow with the other. 5

5. Same as 3, one hand passing over the other. 7

Figure 48.

6. One hand on each side of ladder, outside, travel forward by short steps. (Fig. 49.)



7. Same backward. 8

8. One hand on each side of ladder, take short jumps forward.

9. From a side hang travel sidewise with short jumps, both hands together.

10. With hands together on round, arms straight or bent, jump to next round.



Figure 49.

HORIZONTAL LADDER.

Second Series.

WITH A SWING.

1. From a side hang, travel sidewise.
2. Hands outside, jump forward with each front swing.
3. Jump backward with each back swing.
3. Jump forward with each front and back swing.
5. Jump backward with each back and front swing.
5. With hands on rounds, swing and catch, missing one, alternating hands.
7. The same missing 2 rounds. (Fig. 50.)

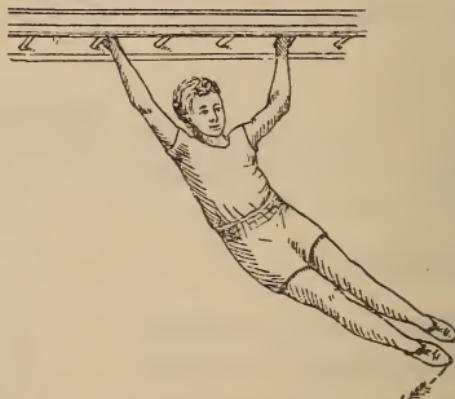


Figure 50.

8. Jump with hands together to next round. 8
9. Same movement skipping 1 round.
10. From a side hang, swing forward and backward and travel sidewise both hands together; one after the other. 9

TRAVELING RINGS.

1. Front swing with half turn. Grasp first ring with right hand, run and catch second with left and on return swing pull up facing ring with chin on level with right hand ; let go right hand, swing forward and catch next ring.

2. Swing with half turn backward. Same swing as in 1 except turn backward to catch next ring.

3. Front swing with a single leg cut off. Same as in 1 and swing right leg over the right ring just before loosing right hand ; continue across right and left in the same manner.

4. Front swing with a double leg cut off. Same as in 3, except do a cut off with both legs.

5. Front swing with a turn. Same as 1 except make one complete front twist between rings.

6. Back swing with a turn. Same as 2 except make one complete back twist between rings.

7. Front and back swing for two persons. One grasps ring with right and the other grasps ring with left hand ; face each other, swing : one executes 1 and the other 2, reversing every other swing.

8. Swing figure-of-8 circles. In this exercise a side swing is added to the long swing, making alternating circles each side of the line of rings.

9. Bent arm start. Same as 1 except at end of pull with left arm hold the bent arm position, then swing to the right in the same manner, at the same time letting the left arm straighten out ; let go with right hand swing forward and catch next ring.

10. Bent arm swing. Take a high swing, then with bent arm, swing as in 1, holding the bent arm position on the swing.

SWINGING RINGS.

First Series.

EXERCISES WITHOUT A RUN.

1. Back somersault between rings. Grasp rings, turn over backward and off. 1

2. Skin-the-cat. Turn over backward, straighten legs and point toes down, return. (Fig. 51.) 2

3. Bird's nest. Turn over backward, catch toes in rings, bend the back, throw chest and abdomen out, return. 3

4. Pull up. Hang down arm's length; raise both legs to the front, knees straight, toes pointed; pull up with chin on a level with rings, 3 times. 4

5. Single leg cut off. Swing right leg up between ropes, cut and catch right hand. Cut and catch on left side. 5

6. Straight arm rest from a jump. Jump to a bent arm rest, and push to straight arm rest between rings. 6

7. Half Latin cross. Pull shoulders up on level with rings, push right hand out at side, hold and count 5. Same exercise on left side. (Fig. 52.) 7

8. Hang from one bent arm.

9. Single bent arm rest. Pull shoulders up to rings, raise right elbow above ring to a bent arm rest. Same left side. 8

10. Straight arm rest. Grasp rings with hands well over, wrists touching rings; pull shoulders up to rings; raise the right, then the left elbow above rings and push up to a straight arm rest. 9

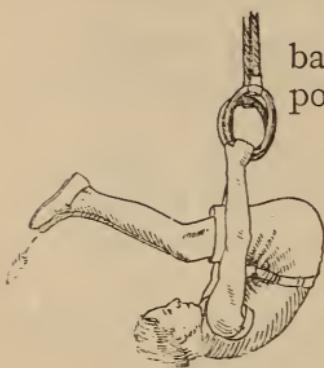


Figure 51.



Figure 52.

SWINGING RINGS.

Second Series.

EXERCISES WITHOUT A RUN.

1.	High front roll. Grasp the rings, jump above, double up and roll forward to floor.	1
2.	Straight arm rest between rings. Pull up slowly and push above rings to straight arm rest between rings. (See 10, First Series.)	2
3.	Back cut off. Swing legs back over head, split, and just as the crotch strikes hands let go.	2
4.	Front cut off. Bring legs up between rings, separate and cut outside. Just as the legs strike arms throw the head forward and let go.	2
5.	Front dislocate. Jump, throw head forward and down, double up and roll over. This exercise is similar to 1, except the body is not so high and the arms are more widely separated.	3
6.	Back dislocate. Take a high back swing and just as the feet pass between ropes separate arms, pull up a little and throw head back.	4
7.	Back lever (or scales.) Turn over backward between ropes and straighten body out at right angles to arms.	5
8.	Continuous front roll (dislocate) and finish with front cut off.	4
9.	Turn over backwards, make quarter turn to side lever on one arm, then push up to a straight arm rest.	7
10.	Back circle up into a straight arm rest. This exercise is similar to circling the bar, though much harder. Keep the hands against the body to avoid doing a back dislocate while trying this trick else it is likely to jerk the shoulders.	8

SWINGING RINGS.

Third Series.

WITH A RUN.

1. Running swing. At the end of the first run forward, let the legs swing up, and on the return, whip them back of center before striking the floor with the toes ; let the legs swing higher back than the body, then whip forward so as to strike the floor in front of the center of the swing. 1

2. Pull up on back swing. Start as in 1, and on back swing pull the shoulders up to rings, then let down on front swing to arm's length ; 3 times. 2

3. Pull up on front swing. Same as 1, pull up on front and let down on back swing ; 3 times. 3

4. Continuous front swing. Start as in 1, and at the end of front swing make half turn with body, cross ropes, whip forward and repeat ; 6 times. 4

5. High swing with a shoot. Start as in 1, on back swing, double and pull up, swing forward, and at the end of front swing shoot the feet up and out ; 3 times. (Fig. 53.) 5

6. Back dislocate. Start as in 1, double up on front swing, then at the end of back swing, shoot the feet out over the head. 6

7. Straight arm rest on back swing. Pull above rings to straight arm rest at end of back swing. 7

8. Straight arm rest on front swing. Pull above rings to a straight arm rest at end of front swing. 8

9. Front cut off. Take a short run, double on front swing and at end of back swing cut both legs outside of hands and land on mat. 9

10. Front cut off and catch. Same as 9 except catch rings after the cut off. 10



Figure 53.

LOW PARALLELs.

1. Rest on bars with arms straight, body rigid, toes on floor; let down between bars and push up. 1
This is a little more difficult with toes resting on bars.

2. Sit on mat between bars, legs extended front, then straighten arms, bend knees, and extend to the rear and return. 2

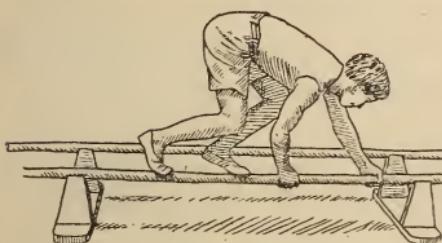


Figure 54.

3. Sit on mat, then raise body to a straight arm position with legs extended front, toes pointed, and walk on hands. 4
7

4. Monkey walk. Walk on all fours along one bar. (Fig. 54.) 8
9

5. Walk on hands. This may be begun with bent legs but should be done with a slight arch of body, toes pointed. 10

6. Hand stand. (Fig. 55.)

7. Hand stand and turn. The body balances on the left arm while the right hand steps on left bar, then the left hand steps on right bar. 12
13

8. Hand stand on one bar.

9. Push up to a hand stand from a sitting position between bars. 14

10. Combine 5 and 7.



Figure 55.

PARALLEL BARS.

First Series.

END WORK.

1. Single leg cut out. Grasp the bars with both hands on top, thumbs in; spring up, swing right leg out over right bar, cut and catch right hand, then down. Same to left. 3

2. Single leg cut in. Swing right leg up on the outside, cut in and catch. Same to left. 4

3. Straddle cut in. Swing up outside and astride bars, catch hands back, swing down between and off. 5

4. Double leg cut out at side. Swing both legs up between bars then over right and off. Same to left. 7

5. Double leg cut out with $\frac{1}{2}$ turn. Same as 4 with $\frac{1}{2}$ turn to the right facing start. Repeat to left. 8

6. Double leg cut with reverse $\frac{1}{2}$ turn. Same as 4 with $\frac{1}{2}$ turn to the left. Repeat to left. 9

7. Side sitting rest. Straight arm rest, swing over bars from side to side so that the hips rest on outer side of bar alternately. 10

8. Single leg front cut. Back to bars, jump up between to a straight arm rest, cut right hand with right leg and off. Same with left. 11

9. Straddle off front. From same position, swing both legs back between and over in a straddle front cut off. (Fig. 56.) 12

10. Vault from right to left over end of bars, facing start. Same to left. 13

11. 14

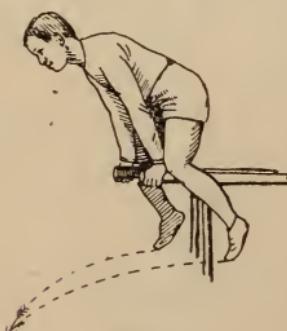


Figure 56.

PARALLEL BARS.

Second Series.

SIDE BARS.

These exercises should be begun with bars at $\frac{2}{3}$ height.

1. Running vault. Stand at side of bars; grasp bar with both hands, vault to right, touch left foot to near and right foot to off bar and over. Same to left.

2. Vault over between and swing out. Left hand under the bar and right hand on top, vault to right over near bar, swing in between bars, grasp off bar with right hand and swing out over off bar. Same to left.

3. Vault to right, clear both bars, touch right hand to off bar in passing over. Same to left.

4. Vault to right, clear both bars. Same to left.

5. Vault over first bar and shoot under second. Vault to right over near bar, step with right hand, then with left on off bar, drop down between bars then shoot under off bar.

6. Same exercise except jump with both hands from near to off bar.

7. Back vault from between bars. Between bars facing side; with both hands on front bar jump and vault out over back bar, feet together.

8. Back roll off. Sitting rest with hands on side bar, fall back to shoulders, roll off.

1

2

4

5

7

8

9

10

12

9. Scissors from side through to straddle bars.



Figure 57.

At side of bars; shoot legs up between bars and let hips rest on off bar, twist and land astride bars, then with aid of arms bring body between and above bars.

13

10. Scissors between and above bars. Straddle bars without a stop.

14

This is practically the same as 9. (Fig. 57.)

PARALLEL BARS.

Third Series.

The exercises in this series are done from straight arm rest between bars.

1. Front straddle across bars. Swing legs forward and astride the bars, knees straight, toes pointed, then place hands in front, swing in between and continue across. In swinging off the bars, turn to the left and hold with left hand until feet touch the floor. (Fig. 58.)



Figure 58.

2. Front sitting rest across bars. Swing legs together, alternately across, on each bar.

1

3. Front walk. Body erect, toes pointed, walk across taking 8-inch steps.

2

4. Front hand and leg walk. Same as 3, except take high steps in air with feet in the same time with the hand steps.

4

5. Back straddle across bars. Step with right hand to left bar, then with left to right, turning backward; swing backward as in exercise 1 holding on with both hands on the swing off. 7

6. Back sitting rest across bars. Turn backward with left hand to right bar, then right hand to left bar, swing legs together backward as in 2.

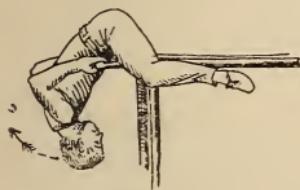


Figure 59.

7. Walk backward across bars. Back to bars, hands on ends and shoulders between; pull body up between bars, separate legs over and catch heels under the bars and bring body above to a

straight arm rest between bars. Walk across backward. (Fig. 59.) 9

8. Jump forward. Take short jumps across bars forward.

9. Jump backward. Swing over on right bar, take hold of left bar with right hand and swing right leg over left bar, place left hand on right bar and swing in between bars, then take short jumps across bars backward.

10. Scissors and dip. Swing over on right bar, astride bars as in 9, place hands back of body, swing in between and make back scissors; grasp bars in front, place feet on top, rest on hands and feet and walk to end of bars, let down and push up 3 times and swing off. 10

Fourth Series.—Repeat Third Series in bent arm position.

PARALLEL BARS.

Fifth Series.

1. Front shoulder roll. Begin with insteps, knees, hands and shoulders resting on bars, double up, roll over, strike thighs on bar in coming down. After some practice this exercise, as well as those following, should be done without resting the body on bars. In all the rolls keep the elbows out over the bars.

2. Back shoulder roll. With arms resting on bars, elbows out and hands in front, take a preparatory swing and continue over to straddle bars. This exercise may be done into a bent arm rest between bars.

3. Front jump and swing from a bent arm rest. In this exercise the front jump is made with each front and each back swing.

4. Back jump and swing from a bent arm rest. Jump backward with each back, and front swing.

5. Top kip. From a straight arm rest between bars, drop back to shoulders, double up like a jack knife, shoot feet out at an angle of 45 degrees and come to a straight arm rest.

6. Front roll and kip. This exercise may be varied by adding a shoulder stand and should be finished with a hand-spring off end of bars.

7. Lion's walk. Straight arm rest between bars; drop to bent arm rest, rest the weight on one arm, swing the other below bars at side and step full arm's length in front, push up to an oblique arm rest between bars and continue across.

8. Straight arm and horizontal leg walk above bars. Straight arm rest, bring legs up to right

B

1

2

4

7

8



Figure 60.

angle to body, knees straight, toes pointed and walk across the bars, swing the legs slightly from side to side and keep them above the bars without touching. (Fig. 60.)

9

9. Back roll to shoulder stand. This may also be done to a hand stand.

10. Back roll to full giant swing on extended arms. 10

VAULTING BAR.

First Series.

HEIGHT OF BAR, THREE FEET SIX INCHES.

1. Vault to right, vault to left.	1
2. Vault to right, hold with both hands and face bar. Same exercise to left.	2
3. Vault to right, bend elbows and let the head and upper part of the trunk dip over the bar so as to balance the weight of legs ; clear the bar. Same to left. This style is used in vaulting for height.	3
5	
4. Vault to right over stick 18 inches from the bar. Same to left.	7
8	
5	
5. Grasp bar with left hand and vault to right ; with right hand vault to left.	8
9	
6. Hook left knee over the bar ; without the aid of hands, spring and throw right leg over. Same from right knee.	10
10	
7. Vault between hands.	11
8. Hands close together, jump with feet outside on the bar, let go and jump off.	12
12	
9. Clear the bar, feet outside of hands.	13
10. Vault to right, cut and catch right hand and without sitting on bar jump off. Same to left.	14
14	

VAULTING BAR.

Second Series.

HEIGHT OF BAR, FOUR FEET.

1.	Grasp bar, run under with arms straight, head back, chest out ; hold until head passes under bar, then spring to upright position.	1
2.	Double vault. Jump to a straight arm rest against bar, swing feet under, and on return swing vault to right. Same to left.	2
3.	Roll over and circle bar. From a straight arm rest on the bar, roll over front, touch feet to floor and return to a straight arm rest on bar.	3
4.	Whip under bar. Jump from floor, shoot feet under bar and as the head passes under, whip feet down and spring from hands to upright position. Begin with a little jump and increase it until the hips reach the height of bar at the start.	5
5.	Hand and foot whip under. Hands close together, jump, strike feet on bar outside of hands, swing under and shoot out as in 4.	7
6.	Same as 4, except shoot the body over a string about 3 feet away from the bar and a little below.	9
7.	Place knees on bar, take hands off and jump over from knees.	10
8.	Shoot over from hand and heel hang. Hang by hands, with heels resting on bar, swing back and forth, and on the swing up shoot body over bar feet first.	11
9.	Shoot over from floor. Jump from floor, catch heels on bar between hands, swing forward and on the return swing shoot over bar as in 8.	12
10.	Front handspring over bar.	13
		14

VAULTING BAR.

Third Series.

HEIGHT OF BAR, FOUR FEET, SIX INCHES.

1. Circle the bar to a straight arm rest against bar then roll off front.
2. Hook right knee on bar outside of hands, swing left leg down and body up to one leg sitting rest on bar.
3. One knee and hand swing backward, knee between hands.
4. Front single knee wheel. With hands facing front, one knee on bar between hands, do a front knee and hand swing.
5. Double knee and hand wheel backward. Both knees between hands on bar, circle backward.
6. Front double knee and hand wheel. Both knees on bar between hands, circle forward.
7. Bent arm back circle. From a straight arm sitting rest on bars, palms front, let down to a bent arm rest and swing a back circle around bar. (Fig. 61.)
8. Hock swing off. Suspend from both knees on bar, swing body and at end of back swing let go and land with feet on floor.
9. Free circle off bar. Circle over bar without touching body and land on other side.
10. Free wheel. Circle into a straight arm rest against bar, then do a free circle around bar to same position.

These exercises are also done on the horizontal bar.



Figure 61.

HORIZONTAL BAR.

First Series.

1. Chin the bar. Jump to side hang on bar, fingers and thumbs on top, flex knees to chest, point toes down, flex arms so as to bring chin above bar.

2. Back somersault under bar. Double up from a side hang, push knees and feet through between hands and drop off.

3. Skin-the-cat. Same as 2 except straighten legs, point toes, and return through hands and off.

4. Swing. Double up as in 1, flex arms enough to bring head up to bar, then shoot feet out front and let out to arm's length; swing backward and forward, jump off back.

5. Start as in 4 and continue swing by doubling up back and shooting out front on each swing.

6. Pull up through to a sitting rest. Same as 2 except pull up to a sitting rest on bar.

7. Single leg mount with a swing. Start as in 4 and, on front swing continue right leg up over bar and come to one leg sitting rest.

8. Hand and foot swing off. Swing and continue the movement until the soles of the feet rest on bar outside of hands, then at end of next front swing jump off.

9. Hock swing from below bar. Same as 8 except continue the front swing so as to hook both knees over bar, then let go hands and swing off from knees at end of front swing.

10. Swinging somersault under bar. Swing and on front movement continue up with feet; on back swing shoot them through between hands. Same as 2 with a swing.

Second Series.—Practice the Third Vaulting Bar Series on the Horizontal Bar.

HORIZONTAL BAR.

Third Series.

1. Push up to a side arm leaning rest. From a side arm hang, raise the right, then the left elbow, above bar and push up to a side leaning rest; roll off front.

2. Front kip. Swing and continue front movement until the body is well forward and insteps touch bar, legs straight; on the return, shoot the feet up and out and snap up to a side leaning rest.

3. Chest heave. From a side arm hang, arch back, throw chest forward, snap heels back, bend arms and snap up to a side leaning rest on bar; roll off.

4. Hock swing. From a sitting rest on bar do a hock swing off.

5. One leg circle. Circle the bar and catch one knee on pull up.

6. Circle bar from a swing to a side leaning rest.

7. Make a free circle over the bar from a swing.

8. Body slam. Take a big swing and pull up from end of back movement to side leaning rest on bar.

9. Shoot over with a swing. On front swing continue feet up between hands and on back swing, shoot over bar to floor. Same as 8 in second series vaulting bar.

10. Shoot over to a bent arm rest and free circle backward. With a reverse grip execute No. 9 except shoot over bar to a bent arm rest, then circle backward around bar. (Fig. 62.)

(See 7, third series vaulting bar.)



Figure 62.

HORIZONTAL BAR.

Fourth Series.

1. Hand, knee and instep circle forward.

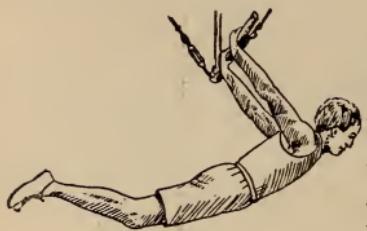


Figure 63.

2. Back lever. From a straight arm side hang, put feet through hands and hold body in a horizontal position, knees straight, toes pointed. (Fig. 63.)

3. Front lever. From a straight arm side hang hold body in a front horizontal.

4. Back half-giant. With a reverse grip do a back half-giant swing to a standing side arm rest on bar.

5. Free hock swing. From a sitting rest on bar, let go hands, slide back, catch knees on bar and swing off.

6. Hand and foot wheel. Hands close together palms front, feet on bar make front circle.

7. Same movement backward.

8. Fly away. From a standing side rest on bar, swing, let go at end of front swing and do a back somersault.

9. Do a front kip and vault the bar.

10. Combine a front kip with a front roll and a big swing to the body slam, then a free circle to a full swing, double up and shoot over bar to floor.

MISCELLANEOUS.

BOHEMIAN WRESTLING.

Grasp right hands, right feet forward, knees bent, left hand on hip or back of body; a fall is counted when either foot is moved from its place on the floor or when any other part of the body touches the floor.

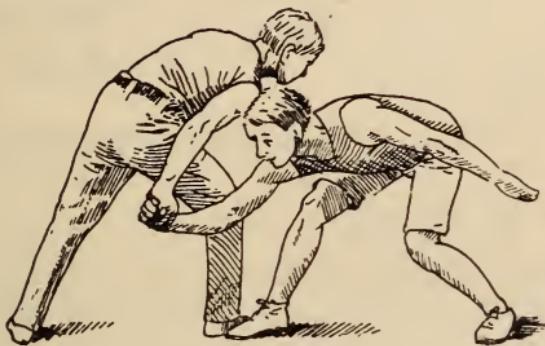


Figure 64.

No part of the body above the right knee and right elbow must be used in offensive work.

The left hand with left foot forward should be used as often as the right in this form of wrestling. (Fig. 64.)

JAPANESE WRESTLING.

Opponents stand on the mat, preferably a wrestling mat, each trying to put the other off so that both feet are on the floor, the one touching the floor first with both feet loses. Any hold is allowed. A traveller told me that the Japanese form a little ring with rice straw and the wrestler who puts his opponent outside of the circle gets the fall.

INDIAN WRESTLING.

Lie flat on back, side by side with feet in opposite directions, clasp right hands and place right elbow in opponent's arm pit, left arm prone on the floor. Swing right leg up a little beyond perpen-

dicular 3 times, bending left knee a little. On third count catch opponent's leg in the hollow beneath knee and turn him over backward. The left side should be used as often as the right in this form of wrestling. (Fig. 65.)



Figure 65.

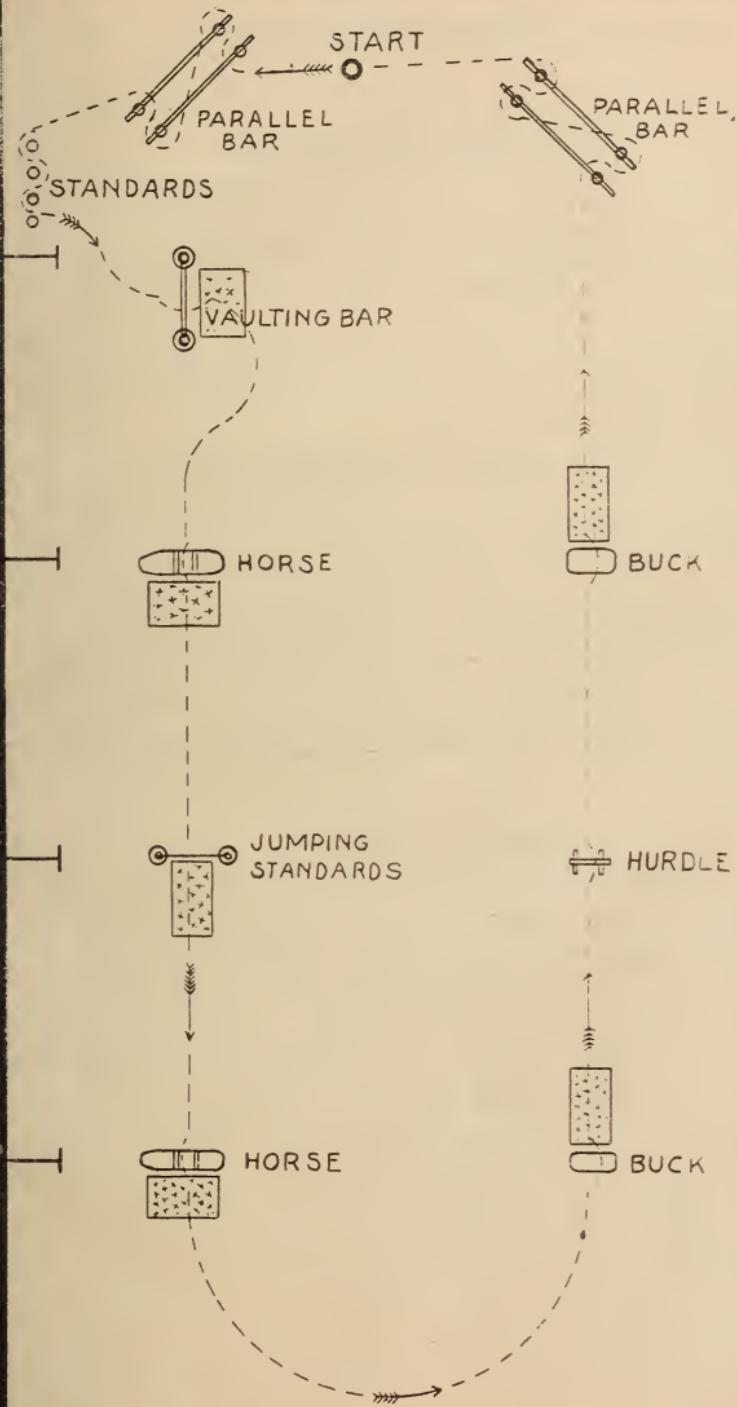
OBSTACLE RACE.

A splendid exercise to finish the hour's work may be had by doing simple tricks on the different apparatus as arranged around over the gymnasium floor, as follows: Run the way the arrow points through the parallels and uprights (see dotted line on the diagram); vault to right or left over vaulting bar; through the pommels, over the horse; dive with a hand-and-shoulder roll over a string 3 feet in height; slide head first over the second horse between pommels and finish with a roll over; split over buck; take a 2-ft., 6-in. hurdle; dive second buck; run through the second parallel bars and finish at the start. A team of 5 or any number may be chosen and the team making the fastest time wins.

INDIAN CLUB RACE.

Place 5 clubs 3 feet apart on marks at one side of the hall; have similar marks the same distance apart at the other side of hall; the object is to take them, one club at a time and place on a mark at the opposite end of the course, and leave them standing where contestants start.

It is a little less difficult if potatoes or apples are substituted for Indian clubs.



RULES FOR THE GYMNASIUM.

The use of tobacco is prohibited in the building.

Students are required to take off finger rings while using any of the apparatus.

All students exercising on the main floor or using the running track must wear a gymnastic suit and shoes without heels or nails.

Visitors will not be allowed on the main floor without special permission from the director.

Students should not attempt any dangerous feat unless under the personal direction of the director or one of the instructors—the gymnasium will not be responsible for accidents if this rule is violated.

The gymnasium is open for young women from 8 A. M. to 12 M.

It is open for young men from 2 to 5 P. M.

It is required that every one who exercises in the gymnasium should first submit to a physical examination; or in default of such examination should bring from his or her physician a written certificate that he or she is physically sound, or a written certificate from the parent or guardian that he wishes the student excused from the examination and that he himself will take the responsibility of the consequences of exercise without the required examination.

LOCKERS

Lockers are \$3.00 per year.

Lockers will be inspected by the director.

Students will be held responsible for any damage to the lockers.

No student will be allowed to keep soiled clothing in the lockers.

All clothing worn next to the person should be washed once a week.

The university will not be responsible for valuables left in the gymnasium.

No clothing will be allowed to remain in the lockers during the long vacation.

If the occupant of a locker is unable to open it he must report the fact to the janitor or at the office.

BATHS AND POOL.

All persons using the swimming pool must bathe before entering the pool. The showers are used for this purpose. All students should see that this regulation is rigidly enforced.

ELCTRIC CHART.

ounds and cubic inches.

WAIST.	DEPTH OF CHEST.	CAPACITY OF LUNGS.	STRENGTHS.					
			BACK.	LEGS.	PULL UP.	PUSH UP.	RIGHT FOREARM.	LEFT FOREARM.
11 8	8.9	315.	450	570	18	16	122.4	115.3
11.1	8.1	301.	428	525	16	14	116.8	110.2
10.8	7.8	286.	393	483	14	12	110.2	103.6
10.4	7.7	269.	353	439	12	10	101.4	94.8
10.2	7.5	257.	331	406	11	8	94.8	90.4
10.1	7.4	245.	328	385	10	7	90.4	86.0
10 0	7.4	237.	306	373	9	6	86.0	81.6
9.8	7 3	226.	287	346	8	4	81.6	77.2
9.7	7.1	217.	273	328	7	3	77.2	72.8
9.5	6.9	206.	258	306	6	2	72.8	68.3
9.3	6.7	192.	229	273	4	1	66.1	63.9
9.1	6.6	178.	218	247	3	0	61.7	57.3
8.7	6.3	162.	210	230	2	0	55.0	53.5

, M. D.

OHIO STATE UNIVERSITY ANTHROPOMETRIC CHART.

Compiled from the Measurements of over five thousand male Students: The figures represent inches, pounds and cubic inches.

PER CENT.	HEIGHT.	WEIGHT.	GIRTHS.																		BREADTHS.										STRENGTHS.					
			Neck.	Chest Repose.	Chest Expanded.	Chest Depressed.	Waist.	Hips.	Right Thigh.	Left Thigh.	Right Calf.	Left Calf.	Right Biceps.	Left Biceps.	Right Arm.	Left Arm.	Right Forearm.	Left Forearm.	Neck.	Shoulders.	Chest.	Waist.	DEPTH OF CHEST.	CAPACITY OF LUNGS.	Back.	Legs.	Pull Up.	Push Up.	Right Forearm.	Left Forearm.						
1	73.8	181.6	15.7	39.5	41.8	36.0	33.7	38.7	23.0	22.8	15.5	15.5	14.0	13.4	12.0	11.8	11.7	11.6	4.7	18.0	13.0	11.8	8.9	315	150	570	18	16	122.4	115.3						
5	71.9	163.7	15.1	38.1	39.8	35.1	32.1	37.9	22.5	23.3	15.0	15.0	13.2	12.9	11.5	11.3	11.3	11.0	4.7	17.4	12.4	11.1	8.1	286	303	483	14	12	110.2	103.6						
10	71.1	157.0	14.9	37.3	39.1	34.4	31.2	37.3	22.0	21.9	14.7	14.6	12.9	12.5	11.2	11.0	11.0	10.9	4.5	17.0	12.1	10.8	7.8	269	353	439	12	10	101.1	94.8						
20	69.9	149.6	14.6	36.4	38.2	34.1	30.3	36.5	21.4	21.2	14.3	14.3	12.4	12.1	10.9	10.7	10.9	10.5	4.4	16.7	11.5	10.4	7.7	257	331	406	11	8	94.8	90.4						
30	69.1	144.1	14.2	35.8	37.5	33.4	29.6	36.0	20.9	20.8	14.1	14.0	12.1	11.8	10.7	10.5	10.6	10.5	4.4	16.5	11.1	10.2	7.5	238	328	385	10	7	90.1	86.0						
40	68.5	140.0	14.1	35.3	37.0	33.1	29.1	35.5	20.6	20.4	13.8	13.8	11.8	11.6	10.5	10.3	10.4	10.2	4.3	16.3	10.9	10.1	7.4	245	306	373	9	6	86.0	81.6						
50	67.8	135.8	13.8	34.8	36.4	32.7	28.7	35.1	20.2	20.1	13.7	13.6	11.6	11.3	10.2	9.9	10.3	10.1	4.3	16.0	10.7	10.0	7.1	237	306	373	9	6	86.0	81.6						
40	67.3	132.0	13.7	34.3	35.9	32.3	28.3	34.7	19.9	19.7	13.5	13.4	11.4	11.0	9.9	9.7	10.2	9.9	4.2	15.8	10.5	9.8	7.3	226	287	346	8	4	81.6	77.2						
30	66.6	127.4	12.5	33.9	35.4	32.0	27.7	34.4	19.5	19.4	13.2	13.2	11.1	10.8	9.7	9.5	10.0	9.8	4.2	15.7	10.3	9.7	7.1	217	273	328	7	3	77.2	72.8						
20	65.8	123.2	13.3	33.2	34.7	31.7	27.2	33.8	19.2	19.0	12.9	12.9	10.8	10.4	9.5	9.4	9.8	9.5	4.1	15.4	10.1	9.5	6.9	206	258	306	6	2	72.8	68.3						
10	64.9	117.7	13.0	32.4	33.9	30.4	26.6	33.2	18.7	18.5	12.6	12.6	10.4	10.1	9.2	9.0	9.5	9.4	4.0	15.1	9.8	9.3	6.7	192	229	273	4	1	66.1	63.9						
5	64.1	112.4	12.8	31.7	33.2	29.1	26.1	32.6	18.2	18.0	12.3	12.3	10.1	9.8	9.0	8.7	9.4	9.1	3.9	14.8	9.5	9.1	6.6	178	218	247	3	0	61.7	57.3						
1	62.0	100.0	12.2	29.1	31.0	28.9	24.5	32.1	17.2	17.0	12.0	12.0	9.5	9.3	8.3	8.1	8.9	8.7	3.7	14.2	9.0	8.7	6.3	162	210	220	2	0	55.0	53.5						

The figures in the first column represent the per cent. above or below the corresponding measurements. E. G. A measurement on the upper 30 per cent. line indicates that 30 per cent. of the total number surpass it, or a measurement on the lower 30 per cent. line indicates that 30 per cent. are below it. The broken line shows the measurements of an individual. In the columns where the line passes below the initial point the parts are deficient. The figures in the 50 per cent. line are the measurements of the average man.

Measurement taken

by M. D.

LC ACQUISITIONS



0 042 450 084 7